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| <b>Notice of Allowability</b> | Application No.<br>10/614,368<br>Examiner<br>Bradley K Smith | Applicant(s)<br>YAGISHITA ET AL.<br>Art Unit<br>2824 |
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to 2/24/04.
2.  The allowed claim(s) is/are 1 and 2.
3.  The drawings filed on 08 July 2003 are accepted by the Examiner.
4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All    b)  Some\*    c)  None    of the:
    1.  Certified copies of the priority documents have been received.
    2.  Certified copies of the priority documents have been received in Application No. 09/609,106.
    3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 7/8/03
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application (PTO-152)
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other Search notes.

RICHARD ELMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

**DETAILED ACTION**

***Election/Restrictions***

1. This application is in condition for allowance except for the presence of claims 3 to 9 non-elected without traverse. Accordingly, claims 3-9 have been cancelled.

**EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows: cancel claims 3-9

In the cross reference add -- This application is a division of 09/609109 now US Patent 6,607,952. --

Delete the abstract and replace with:

-- A semiconductor device with a source and drain formed in a semiconductor substrate; a crystallized gate insulating film formed on the substrate in a region between the source semiconductor and drain; gate electrode formed on the gate insulating film; an insulating film formed on a side surface of the gate electrode and having an amorphous structure formed from the same material as that of the gate insulating film. Furthermore the insulating film is essentially formed from a material selected from the group consisting of cerium oxide ( $CeO_2$ ), zirconium oxide ( $ZrO_2$ ), hafnium oxide ( $HfO_2$ ), thorium oxide ( $ThO_2$ ), yttrium oxide ( $Y_{2}O_3$ ), calcium fluoride ( $CaF_2$ ), tin-calcium fluoride ( $CaSnF_2$ ), titanium-barium oxide ( $BaTiO_2$ ), and  $La_2O_3$ . --

3. The following is an examiner's statement of reasons for allowance: the prior art of record neither teaches nor suggests the formation of a crystallized gate insulating film, and an amorphous insulating film formed from the same material on the side surface of the gate.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tsunashima et al. (US Patent 6,376,888) disclose a dielectric material around the gate electrode but fail to disclose an amorphous dielectric on the side of the gate electrode. Kamata et al. (US Pre Grant Publication No. 2002/0063299) disclose a crystalline gate dielectric layer but fail to disclose an amorphous dielectric on the side of the gate electrode. Ami et al. (US Pre Grant Publication No. 2003/0136331) disclose a method of forming cerium oxide.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K Smith whose telephone number is (571)272-1884. The examiner can normally be reached on 10-6 Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BKS